Letter from the Chair

Dear Alumni and Friends,

It gives me great pleasure to introduce the Department of Biological Sciences newsletter for 2018. It was another action-packed year for our department, with several departures and several new additions. As you will see from this newsletter, our faculty and staff continue to work hard to enhance our research capabilities, educational opportunities for our students and outreach and engagement with our surrounding communities.

This past year saw the departure of our long time Administrative Assistant Ms. Lori McKnight and our undergraduate advisor Ms. Diana Blouin. I want to thank both Lori and Diana for their outstanding service to our department! We will miss you both! Fortunately for our department, we were able to hire Ms. Dorilee Crown as our new Administrative Assistant, Ms. Megan Larson as our new undergraduate advisor and Ms. McKenzie Vliek as a part-time Administrative Assistant. Welcome Dorilee, Megan and McKenzie!

This past year also saw the retirement of long time professor in the department, Dr. Bruce Bejcek. Thanks for your service to our department Dr. Bejcek, enjoy retirement! Joining our ranks as a new professor in the department is Dr. Terri Kinzy, Professor of Biological Sciences and Vice President for Research at Western Michigan University. Welcome Dr. Kinzy!

Our undergraduate and graduate programs in Biological Sciences continue to thrive, to the point where we now have the largest number of students in our majors of any department in the College of Arts and Sciences. Our students have received numerous awards from within and outside the university and many students have given research presentations at local, national and international scientific conferences.

I hope you enjoy this update from your department. As you read through this newsletter do not hesitate to contact me with any comments you may have concerning our successes and failures, and I would greatly appreciate any suggestions for ways we may improve the service we provide to our students, alumni and friends.

Finally, I want to thank you, our alumni and donors for your generous support of our students and programs. Your generosity enhances the teaching and research mission of our department by providing expanded opportunities for travel to distant research sites, travel to scientific conferences, and supports fellowships and awards for scholarship and research by our outstanding students. Thank You Very Much! Go Broncos!

John Spitsbergen, Chair
john.spitsbergen@wmich.edu
Editors: Cindy Linn and Wendy Beane
I am a Professor in the Biological Sciences Department at Western Michigan University. I was born and raised in Chicago Illinois (always a Cubbie and Bear fan) and received my BS and MS degree from the University of Illinois at the Chicago Campus when I was first introduced to neuroscience. Neuroscience has been the focus of my academic career.

I received my PhD from Rice University in Houston Texas, where I analyzed circuitry in the crayfish visual system using electrophysiological techniques. My focus at this time was involved in understanding how normal visual processing occurred. Rice University is also where I met my husband of 30 years, in the neuroscience lab right next door. At the end of my PhD experience, I obtained a postdoctoral fellowship at the University of Texas Medical School on Galveston Island and used my electrophysiology skills to address the modulatory role of calcium in the vertebrate retina.

During that time, my husband received his PhD and I had my first child, a true Texan. We uprooted the family shortly after that for postdoctoral fellowship positions at the University of Utah at the John Moran Eye Center, where I focused on the role of dopamine in the outer retina under light and dark adaptation conditions. My second child was born in Salt Lake City. According to my mother, it was then time to get “a REAL job.” I took an assistant professor position in New Orleans at the Louisiana State University Medical School, where I continued my research in understanding how normal visual processing occurred in the vertebrate retina and taught human gross anatomy. After I received tenure at LSU Medical School, we moved the family once again to Kalamazoo Michigan. I began my career at WMU, while my husband took a pharmaceutical research scientist position at Upjohn/Pharmacia. We have now been here 18 years.

My research at WMU addresses neuroprotection in retinal disease models. This is a very dramatic change from what I had been doing before coming to WMU, but it has been very rewarding. Surprisingly, we have recently changed directions again in the lab due to unexpected results cumulating from our neuroprotection studies. In fact, the graduate and undergraduate students in my lab are now involved in analyzing how an agent applied to the eye is able to generate new adult mammalian neurons. Typically, adult mammalian neurons do not proliferate. It is VERY exciting times in the Linn lab. Taken together, my research activities have been funded by the National Eye Institute of NIH for 23 years.

Besides my research activities, I teach Human Physiology for Biomedical Science Majors in the Department, as well as Biology of Sensory Systems and Animal Physiology to graduate students. Go Broncos!

When I’m not in the lab, I spend most of my time traveling with my husband and Golden Retriever to visit my children and family that are spread out all over the world. We have been to many beautiful and exotic places in this world and every trip just makes me want to explore more and more!!!

FACULTY FOCUS: Cindy Linn

BrdU positive cells (green) demonstrate new mitotically active cells in the adult mouse retina after treatment with an alpha7 nicotinic acetylcholine receptor agonist.
Faculty Focus: Tiffany Schriever

Dr. Tiffany Schriever joined the Department of Biological Sciences in January 2016. The focus of her work is on the ecology of temporary freshwater habitats, its inhabitants, and its conservation. Hydrology is at the core of her research program with the goal of understanding the spatial and temporal variation that affects the structure (how they are organized) and function (how they operate) of ecosystems.

Tiffany fell in love with ecology while obtaining her B.S. at Winona State University in Winona, Minnesota, where her biology classes used the Mississippi River, bluffs, prairies and lakes in town as natural laboratories. She credits her undergraduate thesis advisor for encouraging her to pursue study abroad options in tropical ecology, as well as a Research Experience for Undergraduates position in New York, and graduate school. She was drawn to the study of amphibians and reptiles (aka herps), which lead her to Hammond Louisiana for a M.S. degree at Southeastern Louisiana University specializing in herpetofauna community response to wetland type and hurricane disturbance. It was in Louisiana where her passion for wetland ecology took hold. The diversity of wetlands, the animals living in them, and their connections to changing environmental conditions drove her to study food web dynamics at the University of Toronto, Canada for her PhD. At the U of T, Tiffany worked with Dr. Dudley Williams to write a book chapter about temporary waters and shake up what was known about food web dynamics and niche variation in pond ecosystems. Her PhD research and current research uses environmental gradients and takes a multi-level perspective (population to ecosystem) to understand the processes structuring communities and influencing biodiversity across temporal and spatial scales. Additionally, the PhD work used a natural hydroperiod gradient to test how drying influences pond community organization, food web structure and function, and amphibian diet. The result of this research is one of the few studies to empirically support the idea that disturbance leads to fewer trophic levels in real habitats. During this time, she realized Dudley’s entomological focus was wearing off on her and she from that point on incorporated more and more invertebrates into her research questions.

After her time in Toronto, Dr. Schriever moved to Corvallis Oregon to postdoc at Oregon State University. There she investigated how stream flow variability influences taxonomic and functional trait diversity and macroinvertebrate community organization in desert streams. This research took her to the desert southwest (AZ, NM, CA) for two months out of the year. Tiffany found her inner desert rat. Their research found that less stable, intermittent streams respond more strongly, have lower functional redundancy (fewer species that operate the same in the stream ecosystem), and have less niche space occupied than more stable, perennial habitat communities. This finding is particularly important given the need for, but lack of water in the desert.

Now at Western Michigan University, the vibrant Schriever Lab continues to use natural environmental gradients to understand how hydrology drives species, community, and ecosystem processes. All of the research Dr. Schriever conducts has a strong field component. That is why when she received a Michigan Sea Grant to scour the eastern shoreline of Lake Michigan from Indiana Dunes to Mackinaw City to characterize and inventory the spatiotemporal patterns of amphibian, reptile and aquatic macroinvertebrate species richness and community composition in interdunal wetlands, she was overjoyed! This grant is Dr. Schriever’s opportunity to work outside in a new environment, the coastal dunes, and train several graduate students. Our work will provide land managers with data on how our threatened coastal wetlands are connected and used to ensure best management and conservation priorities.

Outside of work, Tiffany enjoys running, biking, knitting, and baking sweet treats. Her energetic two-year old, trouble making dog, and always up for an adventure husband keeps her active and outdoors. The family is looking forward to welcoming a baby girl in the spring.

https://sites.google.com/view/schrieverlab/hom
2018 Western Michigan University Distinguished Alumni Award

Dr. Jim Olson

The Western Michigan University Distinguished Alumni Award was issued to Dr. Jim Olson in 2018. This is a very select award that is issued by WMU each year. Dr. Olson gave an inspiring seminar in October at WMU entitled, “Discovering and Designing Drugs with Guidance from Nature.”

Dr. Jim Olson earned his BS in Biomedical Sciences from Western Michigan University and the Lee Honors College in 1984. He went on to earn a Ph.D. in Pharmacology in 1989 and an M.D. in 1991, both from the University of Michigan. He completed his residency in pediatrics in 1994 and completed his fellowship in pediatric oncology in 1997, both at the University of Washington. He is currently professor of Pediatric Hematology-Oncology at the University of Washington School of Medicine, is an Attending Physician at Seattle Children’s Hospital and a full member at the Fred Hutchinson Cancer Research Center.

Olson is a physician scientist who cares for children with brain tumors and discovers/develops new cancer therapies. His lab’s work led to 5 national clinical trials, of which he leads a Phase III trial through the Children’s Oncology Group. His team has invented a scorpion-derived chlorotoxin-based Tumor Paint, which is being used a to make certain cancers light up in a child’s brain. “Being able to visualize tumors in the pediatric brain significantly improves recovery as the vast majority of tumors can now be removed.”

Dr. Olson’s research is also generating new mouse models of medulloblastoma, the most common childhood malignant brain cancer, and testing candidate drugs that interfere with the aberrant signaling pathways. Towards this end, a national consortium for pre-clinical analysis of new compounds is underway. So far, Dr. Olson’s studies has demonstrated efficacy of two drug classes, retinoids and cyclopamine derivatives that effectively induce apoptosis in medulloblastoma cells derived from patient surgical samples and in established medulloblastoma cell cultures. “We elucidated the mechanism by which retinoids induce apoptosis, providing a basis for understanding why some cells are sensitive to this agent and others are resistant. Based on these data, we are developing a national Phase III clinical trial through the Children’s Oncology Group to assess the efficacy of retinoids in children with high risk medulloblastoma/primitive neuroectodermal tumor.”

We thank Dr. Olson for his thought provoking seminar.
In September, Dr. Grant McFadden, gave a stimulating lecture in Biological Sciences entitled, “Oncolytic Virotherapy with Myxoma Virus.” Professor McFadden is the director of the Biodesign Center for Immunotherapy, Vaccines, and Virotherapy (B-CIVV) at ASU. He received his doctorate in biochemistry from McGill University in Montreal, Canada. He has held previous faculty positions at the University of Alberta, the University of Western Ontario, and the University of Florida and was a visiting sabbatical professor at Harvard Medical School. He was awarded a Canada Research Chair (Tier I) in Molecular Virology in 2001 and, in 2005, he was awarded a Howard Hughes Medical Institute International Scholarship.

The McFadden lab studies how poxviruses that cause immunosuppression interact with the host immune system. His group pioneered the field of viral immune subversion (also called “anti-immunology”), and is credited with the discovery of a wide spectrum of virus-derived inhibitors of the immune system. His lab also investigates host-virus tropism, and the deployment of poxviruses for oncolytic virotherapy for the treatment of cancer, particularly with myxoma virus, which was the focus of his seminar at WMU. He is also currently developing human clinical trials that exploit virotherapy with myxoma virus to improve hematopoietic stem cell transplantation therapies for cancer, in collaboration with a biotech company called DNAtrix. To date, Professor McFadden has published over 340 scientific papers and reviews.

Professor McFadden was inducted as a Fellow of the Royal Society of Canada in 2004, the Canadian Academy of Health Sciences in 2005 and the American Academy of Microbiology in 2007. He is the co-editor-in-chief of the journal PLoS Pathogens, a senior editor at Journal of Virology, and was the president of the American Society for Virology 2015-16.

WMU’s Bach Lecturer is sponsored each academic semester by the Michael K. Bach Distinguished Visiting Lectureship Endowment Fund and the Department of Biological Sciences. We thank Dr. McFadden for his visit and for the insight into his exciting research.
The majority of faculty members in our department have active funding for their research programs. Included below is a list of current external grants, publication in scientific journals, and presentations by faculty and students at scientific conferences. As you can see, our faculty and students are active in publishing in top scientific journals and in giving presentations at national and international scientific conferences. We are convinced that a strong and vibrant research environment enhances our student’s educational experience and adds value to a degree from our department.

A. Faculty Research Activities

Current Funding for 2018

Wendy Beane
Title: Molecular mechanisms regulating neural regeneration in planarians
Source: National Science Foundation CAREER Award

Devin Bloom
Title: Systematics and Evolution of Migration in Clupeiformes (Herring, Sardines, Shads, Anchovies and Their Allies)
Source: National Science Foundation, Division of Environmental Biology

Kathryn Docherty
Title: EAGER NEON: Exploring Ecosystem Contributions of Microbial Diversity to the Vertical Atmosphere
Source: National Science Foundation.

Jeremy Duncan
Title: Determining the molecular landscape necessary for hair cell development.
Source: National Institutes of Health (NIDCD)

Karim Essani
Title: Oncolytic tanapoxvirus recombinants for the experimental treatment of human triple negative breast cancer in immunocompetent mice.
Source: Mi-Kickstart Grant

Rob Eversole
Title: WiggleTron development for rapid determination of bloodborne microfilaria
Source: WMU IPMCAC

Sharon Gill (Co-PI Maarten Vonhof)
Title: Examining Impacts of Military Noise on Bird Communication and Singing Behavior
Source: Department of Defence, EQ1 Basic Research Program

Pam Hoppe
Title: Defining the role of the protein kinase UNC-82 in organizing muscle contractile filaments
Source: WMU FRACAA

Chuck Ide (Marla Fisher and Carson Reeling Co-PIs)
Title: Independent Risk Analysis for the Straits Pipeline
Source: State of Michigan Grant (subcontract from Michigan Technological University)

Chuck Ide
Title: Cell and Molecular Basis of Neurodegeneration in Multiple System Atrophy

Source: MSA Private Ongoing Grants

Dave Karowe
Title: Research Experience for Undergraduates (University of Michigan Biological Station)
Source: National Science Foundation

Terri Kinzy
Title: Regulators of translation elongation factor eEF1A
Source: National Institutes of Health (NIGMS)

Cindy Linn
Title: Evidence of BrdU positive neurons in adult mammalian retina after treatment with an alpha7 nAChR agonist.
Source: National Institutes of Health, National Eye Institute

Cindy Linn
Title: Activation of retinal pigment epithelium induces neurogenesis in an adult mammal.
Source: WMU FRACAA

Silvia Rossbach
Title: Bacteria to the rescue: a compass for cleaning up oil spills.
Source: Western Michigan University Faculty Research and Creativity Activities Award.

Silvia Rossbach
Title: Influence of different iron oxide minerals on hydrocarbon degradation
Source: Minnesota Pollution Control Agency.

Dave Rudge, Co-PI (PI Heather Petcovic)
Title: MI STAR
Source: Michigan Technological University

Tiffany Schriever (Co-PI Devin Bloom)
Title: Tracking biodiversity, community assemblage, and gene flow among interdunal wetlands in the Great Lakes
### B. Papers Published in 2018

As a result of faculty research in the department and collaborations within WMU and around the world, a large number of quality journal articles have been published in 2018. These publications add significant value to a degree from our department and emphasize the Department’s commitment to undergraduate and graduate education.

**Bold = Biological Sciences Faculty, underlined = Biological Sciences Graduate Student, italicized = Biological Sciences Undergraduate Student**


C. Faculty and Student Presentations

Our faculty and students are active in giving presentations at local meetings as well as at major national and international scientific conferences. Presentations help develop our students’ ability to discuss their research data and introduces research done in the Department of Biological Sciences locally, nationally and at an international level.

(Bold = Biological Sciences Faculty, underlined = Biological Sciences Graduate Student, italicized = Biological Sciences Undergraduate Student)

T. J. Barkman. Phylogeny and population genetics of Rafflesia. Sandakan Forest Research Centre, Sabah, Malaysia. August 9, 2018

T. J. Barkman. Phylogeny, biogeography, and population genetic studies of Southeast Asian plants. University of Malaysia, Sabah, Malaysia. August 13, 2018

T. J. Barkman. Testing evolutionary hypotheses in a parasitic plant genus that produces the world’s largest flowers: the Rafflesia berry does not fall far from the tree. Kellogg Biological Station, Michigan State University. October 12, 2018

T. J. Barkman. Evolution of Plant Specialized Metabolism: replaying the evolutionary DVD of the SABATH methyltransferase family history. Plant Biology, Michigan State University. November 16, 2018

Van Huizen AV, Kinsey LJ, Von Kannon D, and Beane WS. Weak Magnetic Fields Affect Blastema Growth Via Changes in ROS-Mediated Signaling. 2018 International Planarian Meeting, Madison, WI.


Byrd-Jacobs, C.A. and S. Stapleton. 2018. Plan It 4-Ward: A holistic...


Sarah Almuhanna, Pamela Hoppe. A candidate gene approach to identify kinases that activate the UNC-82 protein kinase in muscle. Midwest C. elegans Meeting, April 7, 2018, Eastern Michigan University


Sarah Almuhanna, Albert B. Lam, and Pamela Hoppe. Studies of the regulation and function of the AMPK-related kinase UNC-82 in body-wall muscle. 2018 Meeting on C. elegans Stress, Pathogenesis, Aging, Metabolism and small RNAs, June 28, 2018, University of Wisconsin, Madison


Decker D, Pattison C, Cooley-Themm C, Linn DM*, Linn CL. 2018. GDF-15 levels increase in aqueous humor following hypertonic saline injection into the episcleral vein in a rat glaucoma model. ARVO abstract. Honolulu, HI. (* adjunct faculty in biological sciences)

Yan Lu. May 18, 2018, Department of Biological Sciences, College of Life and Environmental Sciences, Shanghai Normal University, Shanghai, China, host: Jirong Huang. Seminar Title: Chloroplast RNA editing.

Yan Lu. May 21, 2018, Institute of Plant Physiology and Ecology, Shanghai Institutes for Biological Sciences, Shanghai, China, host:
Hualing Mi, Seminar Title: Chloroplast RNA editing.

Yan Lu. June 1, 2018, Department of Biological Sciences, College of Life Sciences, Northwest Agriculture and Forestry University, Yangling, Shaanxi, China, host: Fei Yu, Seminar Title: Chloroplast RNA editing.


Steve Malcolm. Invited speaker, Grand Forum, Grand Valley State University, Grand Rapids, Michigan, 20 February 2018, to present “Monarchs, migration and human threats.”


Schriever, TA. 2018. Hydrologic variation and freshwater dynamics from species to ecosystems. Kellogg Biological Station, Michigan State University.


John M. Spitsbergen. Invited Seminar, Department of Biomedical Sciences Seminar Series, Grand Valley State University. 2018.
Graduate Student Activities.

The past year has been an outstanding one for students in our programs in Biological Sciences. Graduate students were included as co-authors on 24 papers published in peer-reviewed scientific journals (see above), students gave 24 presentations at scientific conferences (see above) and received numerous grants and awards (see below).

Graduate Student Awards Presented to Students in the Spring 2018

Hazel Wirick Scholarship (Awarded through Kalamazoo Garden Club) - Nicole Dubs

Distinguished Biological Sciences Graduate Student – Alanna VanHuizen

Department Nominations for Graduate Research and Creative Scholar (Graduate College)

Masters (MS) – Teaching – Angela Kennedy-Mendez
Masters (MA) – Teaching – Christy Kalata
Masters - Research – Jamie Smith
Ph.D. – Teaching – Taylor Birkholz
Ph.D. – Research – NaTasha Schiller

Leo C. Vander Beek Graduate Student Plant Biology Award – Sadia Kana

MPI Outstanding Graduate Research Award – Master’s level – Jamie Smith

MPI Outstanding Graduate Research Award – Doctoral level – Thomas Groves

Department of Biological Sciences Student Travel Awards – Alanna VanVanhuizen, Gabriel Alves

Western Michigan University Graduate Student Travel Grant – Jonathan Eiseman
My Three Minute Thesis Competition

“An average Ph.D. thesis is about 80,000 words, which would take nearly 9 hours to present. How about sharing it with a broad audience who might or might not know anything about your research in just THREE minutes and ONE Power Point slide? That’s what I did in Spring of 2018! The 3 Minute Thesis Competition, founded by the University of Queensland, Australia, in 2008, now has brought over 600 universities from over 65 countries together.

It sounded like quite an adventure to participate in the competition, after all it was only three minutes and one slide... Wait a second, THREE minutes and ONE slide? I decided to approach this from a creative point of view and drew my thesis using just one page. After teaching for several years now, I am convinced that unless you can explain the topic using a dry erase board and a marker – you cannot explain anything. That was, as it turned out, a winner strategy for me. The audience and judges were listening to me so carefully, gifting me more confidence as the time was quickly approaching to the end. I took the first place and a $500 prize for sharing my research in just three minutes and one slide.

Later that Spring, I was honored to give a talk at Bronco Con and participated in the Midwestern Association of Graduate Schools 3 Minute Thesis contest representing Western Michigan University. Lastly, I finished the circle of participating in the contest by serving as a judge for the Fall 2018 competition.”

Tanya Petrachkova

Grand Prize at Outstanding Poster Presentation at 2018 WMU Research and Creative Activities Poster and Performance Day – Susanne Var

Inducted as a member of the Honor Society of Phi Kappa Phi – Susanne Var


American Association of University Women (AAUW) - Battle Creek Scholarship – Mary Lian

Carlos M. Gutierrez Scholarship – Mary Lian

International Zebrafish Society Travel Award – Tanya Petrachkova

Society of Wetland Scientists student research grant – Andrew Hopkins
My name is Thomas Groves and I am a PhD candidate in Dr. John Jellies’ lab. We study the medicinal leech as a model system to answer questions about the neural basis of light-guided behavior. More specifically, we are interested in how the leech visual system uses arrays of simple eyes to extract information about visible and ultraviolet light as well as temporal patterns to inform its central nervous system of the animal’s position in three-dimensional space. Our work establishes how mapping of intrinsic properties of primary photoreceptors encodes key features of visual images and provides insight into how this stream of information is presented to the CNS to drive adaptive behaviors in these animals.

Before pursuing a graduate degree at WMU, I completed my bachelors of science in psychology at Centre College in Danville, Kentucky. I was fortunate to return to my home state to work with Drs. Smale, Yan, and Nuñez as a research assistant in the Neuroscience Program at Michigan State University. There, I studied circadian rhythms in a diurnal rat, *Arvicathis niloticus*. Working with Dr. Jellies to further my knowledge of neurobiology has been the greatest opportunity of my early career as a scientist, and I am grateful for his guidance and the additional guidance of many other members of the Department of Biological Sciences.

Following the completion of my degree at WMU, I plan to pursue a professorship and educate new generations of scientists and health professionals.

When I am not busy poking leech neurons and planning lectures, I enjoy spending time with my wife, Seema, and our two dogs, Lambeau and Murray. We love going on trail walks, spending time in northern Michigan, going to the farmers’ market, and visiting the craft breweries of Kalamazoo.
Undergraduate Student Activities and Focus

Student Activities.

The past year has been outstanding for our undergraduate students in Biological Sciences. Undergraduate students were included on 14 peer-reviewed journal articles and 6 undergraduate students gave presentations at scientific conferences (see above) and received numerous awards (see below) in 2018.

Student Grants and Awards.

Undergraduate Students

Presidential Scholar in Biological Sciences – Kelsey Cushway

Distinguished Senior in Biomedical Sciences – Gabrielle Watson and Maninder Randhawa

Distinguished Senior in Biology – Samantha Hack and Eric Branch

Distinguished Pre-Professional in Biological Sciences – Ramsey Potter

Merrill Wiseman Award in Microbiology – Helene Woyczesczyk

Hazel Wirick Scholarship (Awarded through Kalamazoo Garden Club) - Tonia Aho

Colin J. Gould Memorial Scholarship – Meskerem Tolossa

Frank Hinds Zoology Award – MacKenzie King and Emily Bolhuis

MPI Outstanding Undergraduate Research Award – Breanna Varker and Marwa Saad

Margaret Thomas Du Mond Award – Kelsey Cushway and Matthew Gibson
I am so grateful for the opportunities I have had as a Biology student here at WMU. My freshman year, I came in with very little science experience and passions mainly for music and writing. However, in my first biology class, I realized that I enjoyed learning about science and all the interesting details about life processes that I never knew existed. In the fall of my second year, I was able to start working in Dr. Gill’s Sound Ecology lab on a Field Sparrow night-song project, which combined music and science in a way I had not previously thought possible. Starting to work in the lab was a pivotal point in my college career, because I learned what a career in biology could actually look like. I learned first-hand by working in the lab and the community of people I met there how wide, interesting, and important the realm of ecology is, and gained a newfound sense of purpose as a biology student. The experience I had working in the field that summer recording birds for ongoing projects, mist-netting, color-banding, and getting to know and understand our focal species made me even more excited for all biology has to offer. Since then, I have attended my first two conferences, spent another summer collecting data for my own project: ‘Response of Field Sparrow (Spizella pusilla) to distinct conspecific song types’ funded by a Research & Creative Activities scholarship from the Lee Honors College for my 2019 Honors Thesis, worked as a Learning Assistant for BIOS 1100, 1600, and 1610, studied human disturbance on marmot colonies at the Rocky Mountain Biological Laboratory in Colorado, served as the Media & Outreach Chair for the Western Michigan Biology Club (2017-2019), and gotten involved in the science community in Kalamazoo. Through studying Biology here at WMU, the students and professors I have met have helped me foster a new love and appreciation for nature that I hope to continue and share with others in my future endeavors.
I am retiring after 20 years working here at WMU. I would like to comment on how incredibly interesting my time here has been, and how one person, President Elson Floyd, was the architect who made it all happen.

I spent the first 16 years of my career as a professor at Tulane University. For the last 10 of those years I served as the Deputy Director of the Tulane/Xavier Center for Bioenvironmental Research. In 1998, I moved to Western Michigan University to direct and develop a similar research center. During my first year at WMU, my colleagues and I focused on creating an interdisciplinary research project involving laboratory work, fieldwork, education, and public outreach regarding the effects of PCB pollution in the Kalamazoo River Superfund Site. Our goal was to help the EPA assess how PCB pollution compromised ecosystem health, and the health of people who consumed fish from the river.

When we had our preliminary plan in place, I met with President Floyd to update him about the Kalamazoo River project and to discuss the space needs of the center. I had worked directly with the president of Tulane University, but frankly it was somewhat intimidating, he rarely smiled, and the meetings were brief. On the other hand, President Floyd smiled broadly, was easy to talk with, and near the end of our conversation, said let's go see what space might be available for the new center. I was totally amazed as he led me out to his personal vehicle, and drove me around the campus pointing out several buildings and saying, "How about that one, or that one"? I explained that we needed laboratory space, office space, and meeting room space, so we finalized a plan to house the new center in newly opened Haenicke Hall and in Wood Hall.

A short time later he asked me to accompany him on a trip to Washington, DC where we met with the Michigan congressional delegation to gather support for our helping EPA with research related to the Kalamazoo River Superfund site.

Dr. Charles Ide

I joined the Department of Biological Sciences in August 1991 having been offered the position in 1989 when I was a postdoc working with Lincoln Brower at the University of Florida. As an “alien” Englishman I had to return to England to apply for permanent residence. I spent 2 years at the Silwood Park research station as part of Imperial College, London and was part of a team doing the first ecological risk assessment field research on genetically modified plant crops.

One of the primary reasons I was attracted to WMU was its location in the center of the distribution of common milkweed in the northern USA. This nerdy justification was perfect for me since the plant is so interesting and supports a fascinating community of warningly colored insects whose interactions are mediated by toxic steroids. I had been working on similar interactions in England and Florida, but I was very keen to set up my own laboratory and start some new chemical techniques to analyze steroids in milkweeds, insect herbivores and predators. These insects include the monarch butterfly and inevitably this has been a major focus of my efforts at WMU.

The start of my tenure was a wee bit rocky with separation across 2 buildings – Wood Hall and McCracken Hall, but Len Ginsburg as chair was very supportive and kindly found me a great lab and office space in McCracken and I was able to set up a wonderful high performance liquid chromatography system that was generously donated by the Perrigo Corporation. This enabled me to house a stellar sequence of graduate students working on all of the different insects feeding on milkweeds in Michigan. One of the delights generated by mentoring students is to watch them mature into talented scientists and I have been very fortunate to have had some great and productive graduate students work with me. I can’t

Retirement Perspectives:

This year, two of our faculty will retire from the BIOS department after many years of service to the University. They have graciously agreed to include a perspective on their academic career for this year’s newsletter.

Dr. Stephen Malcolm

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We also visited the Deputy Director of the National Institutes of Health. President Floyd asked her, "What is the future of biomedical research". She replied, "Research that uses tools associated with the newly sequenced human genome, and other animal, and plant genomes. He looked at me and said, "Can we do that"? I answered, "Absolutely, but the equipment will be very expensive". He smiled and said, "We will do it!"

This of course was a scientist's dream come true. We purchased the equipment immediately and began work on projects using fish, frogs, and mammalian tissue culture cells. The projects determined how PCBs compromise health by altering the expression of genes. Since President Floyd had alerted the WMU publicity office about our new Center's approach, the office convinced the Wall Street Journal to write an article about how our center housed one of the first academic labs to use new genomics-based tools for defining health risks from pollution at the level of gene expression. The WSJ reporter focused on one project where we used the new tools to show that PCBs create a Parkinson's disease like syndrome in tadpoles by turning off the genes that code for molecules that regulate motor behavior. I think his choice was driven by the fact that the Hudson River in New York is also highly contaminated with PCBs, and whether to clean up the pollution, and by how much, was a very contentious issue. The same was/is true of the PCB pollution in the Kalamazoo River.

Although I have lived in the USA for 35 years, my formative years were spent in London, England where I attended high school. I was born in South Africa and started school in Zambia and with my family I moved to England when I was 10. I think it was the African beginnings that woke an early interest and passion for nature and I always wanted to be some sort of a "zoologist." After high school in north London, I attended the University of Manchester for an honours BSc degree. Then I was looking for adventure and curiously I was offered a scholarship to do a PhD at Rhodes University in South Africa. This was not a great success academically so I cut my losses and wrote up a master's thesis. However, this turned out to be a great choice because my external examiner was The Honourable Miriam Rothschild – a famous figure in my field of interest in the chemical ecology of plant-insect interactions. I returned to England with a BMW motorcycle on a cargo ship and immediately received a summons to meet Miriam. To cut a longer story short, she persuaded me to go to the University of Oxford for my doctorate and I had a wonderful and productive time as a member of Jesus College. From Oxford I went for a postdoctoral fellowship at the University of Florida to work with Lincoln Brower and eventually made it to Kalamazoo in 1991.

Shortly after the article was published, I was contacted by a caregiver in New York whose wife had a terrible form of Parkinson's disease called Multiple System Atrophy, both totally paralyzing and lethal. The caregiver arranged a meeting for me with his wife's neurologist and a neuropathologist who runs the Brain Bank at Columbia University Medical Center in New York City. We worked out a project where the Brain Bank would provide tissues from people who passed away from this terrible disease and also matched controls who passed away from non-neurological causes. We analyzed the tissues with the new machinery that President Floyd had

I have enjoyed delightful and productive sabbaticals with my colleague Dr Myron Zalucki at the University of Queensland in Australia and also a year working on monarch butterfly migration in the Andes of Bolivia and Argentina. Part of what we have been doing is to use milkweed steroids as “fingerprints” of origin so that we can describe monarch butterfly migration in time and space. It has been fascinating working in South America because practically nothing is published or known about what monarchs are doing there. It has been fun to address a clean slate and start to try and fill it with the information we have gathered. We have published some of this work and I am looking forward to retirement so that I can use the time to publish the rest of our data and analyses.

In addition to my research and work with graduate students I have thoroughly enjoyed teaching ecology at WMU. I have tried hard to use writing as a tool to encourage ecological literacy in our students. To this end it is wonderfully gratifying to watch the process of the “penny dropping” as students realize that researching a topic is fun and that it is even more rewarding to craft a well-worded rhetorical argument based on sound deductive reasoning. In addition to the undergraduate and graduate ecology classes I also taught a tropical ecology class in Belize. I started this in 2000 once I had managed to wrest the course away from the Geography Department. This proved to be an immensely rewarding course to teach. Every group of students I have taken to the forests and reefs of Belize have been incredibly enthusiastic about the experience. From my perspective, it has been especially rewarding because I have them captive for 3 weeks, every day and all day. It is amazing what we can get done and achieve and I wish all of our teaching could be conducted in such a focused manner!

provided. This led to a research publication defining which genes in Multiple System Atrophy brain cells were not doing their jobs, and which genes were actually over-active to the point of causing damage. The new equipment measured the activities of over 20,000 genes in an afternoon. Without this equipment, it would take us an afternoon to measure the activity of just three genes. I felt like Rip van Winkle, newly awoke from a 100 years nap, able to accomplish 24 years of work in a single afternoon.

Publication of our Multiple System Atrophy paper led to a new collaboration with the Vanderbilt University Medical Center. A wonderful fundraiser was held in Nashville, sponsored by Fernando Bryant, a Super Bowl champion Pittsburg Steeler who, with his teammates, donated all sorts of memorabilia for auction (I bought a Super Bowl football signed by the Steeler quarterback). The project involved gene expression analysis done on blood cells from living MSA patients, Parkinson’s patients, Pure Autonomic Failure patients, and control volunteers. One nurse told me that in her zeal to get blood samples from age matched controls, she cornered a doctor in the hospital hallway and told him she needed a blood sample from him to match up with a 62-year-old patient; he dryly commented that he was only 55 years old, thank you.

The final important administrative action President Floyd did to help the new Center was to negotiate a partnership with the Michigan Tech Research Institute, an Information Technology group that specializes in satellite remote sensing of environmental data and in creating interactive/smart websites. Thus, the WMU Environmental Institute partnered with Michigan Tech Research Institute to form the Great Lakes Environmental and Molecular Sciences Center (GLEAMS), which was funded by EPA in the form of three grants for a total of eight years. The funded work provided an online website where a person interested in eating fish caught from any 1000 foot contaminated section of the river could easily find the PCB concentrations in river sediments, and the health risks of living there for smallmouth bass, eagles, and mink. An interactive tool allowed you to fill in your age, weight, sex, and how much bass you expected to eat/month to find out your health risks for cancer, developmental problems, and immune system problems linked to ingestion of PCBs in fish caught from that section of the river.

Over the course of the EPA projects, the work gave rise to undergraduate research projects and senior theses, graduate Master’s and Ph.D. degrees, new courses, and partnerships with local stakeholder groups dedicated to protecting ecosystem and human health in the Lake Michigan Watershed.

All of these activities were instigated and guided by President Floyd’s administrative skills and devotion to the faculty and students at WMU. He went on to become President of the University of Missouri and then Washington State University, only to pass away at the age of 59 from cancer. His obituary
Lastly, I have enjoyed some wonderful colleagues in the Department over my 28 years at WMU and Kalamazoo has been a splendid place to raise a family. I feel “globally engaged” and I hope that I have contributed to all three “pillars” at WMU during my tenure and I am grateful for all of the positive outcomes I have enjoyed over the years. Thank you to my colleagues and especially to my departmental chairs over the years who so ably facilitated my research, teaching and service activities at WMU – Dick Pippen, Len Ginsburg, Len Beuving, Alex Enyedi, Dave Cowan and John Spitsbergen.

referred to him as a "Visionary President", something I was absolutely sure of from the day I met him. I am still in awe of the biological research and education opportunities he created for all of us here at WMU.
My time at Western influence(d) my career/life by: “Allowing me uncompromising flexibility and creativity in guiding my PhD project. I was able to come to a lab and take the research the lab was doing in a new and exciting direction. I was given support and guidance with the understanding that the success or failure of the project was my own responsibly. In short, I was given the latitude to fail. This allowed me to take risks and make mistakes that ultimately led to new discoveries and allowed me to pursue the career of my dreams.”

Mark Webster, PhD
WMU Alumni
Outreach Activities

Besides active interest in research, teaching and service to the University, many faculty members are dedicated to outreach activities that bring their research interests and knowledge to the community. Below are some images from outreach activities that faculty and students were involved in for 2018.

Portage Northern Middle School STEM Outreach event: This event was sponsored at Western Michigan University and was organized by our Chair, Dr. John Spitsbergen.
Portage Northern High School STEM Outreach event: Graduate students in the Schriever lab designed a wetland ecology activity for the Portage Northern High School STEM day event in November. Students learned about different insects, their adaptations, and habitat requirements.

Kalamazoo Area Mathematics and Science Center Activities:
A high school student from the Kalamazoo Area Mathematics and Science Center, has been working in the WMU biological sciences lab of Dr. Yan Lu as part of their training at KAMSC. The student studies whether simultaneous loss of two mitochondrion-targeted nitrogen-fixation-subunit-U proteins, NFU4 and NFU5, influence the amounts of iron-sulfur (Fe-S) proteins in the mitochondria of the model plant species Arabidopsis thaliana.
In times when state funding is decreasing, the support we receive from friends and alumni is vitally important. To help support the mission of the department, you can donate online (via credit card) by going to MyWMU using the following link.

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